

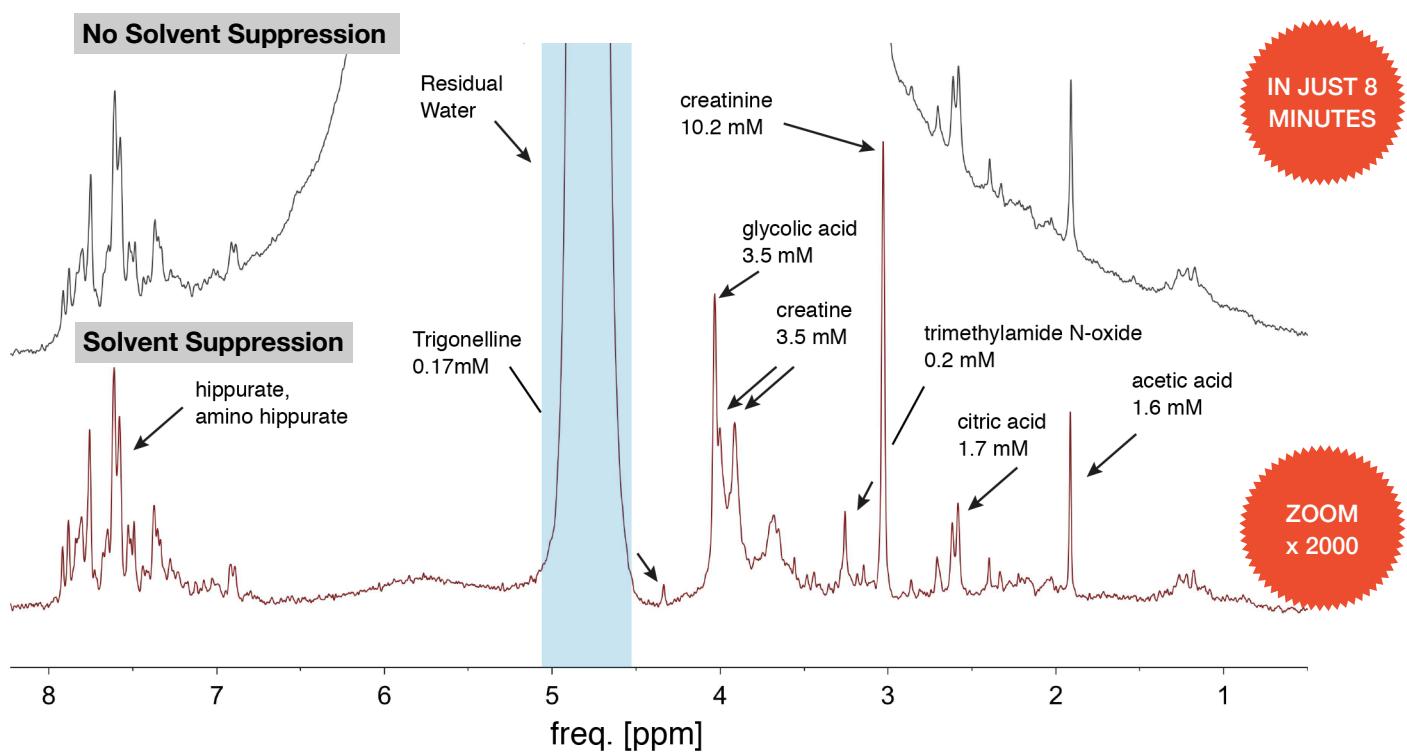
Spinsolve^{ULTRA}

The homogeneity of a superconducting magnet on your bench

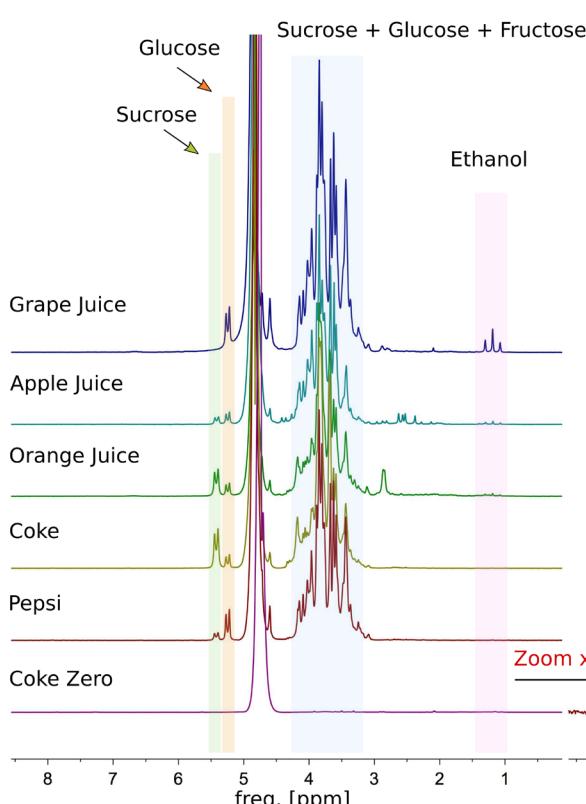
Ultra-high field homogeneity combined with solvent suppression allows you to resolve in few minutes analytes dissolved in protonated solvents at sub-millimolar concentrations.



Resolving metabolites in urine at milli-molar concentrations

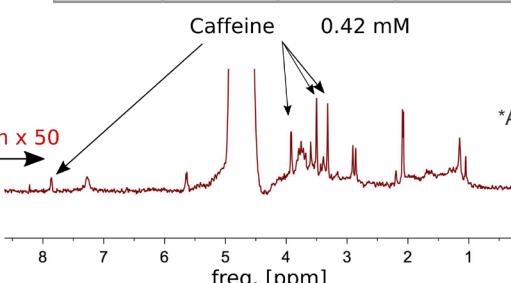


Measuring sugar content in soft drinks



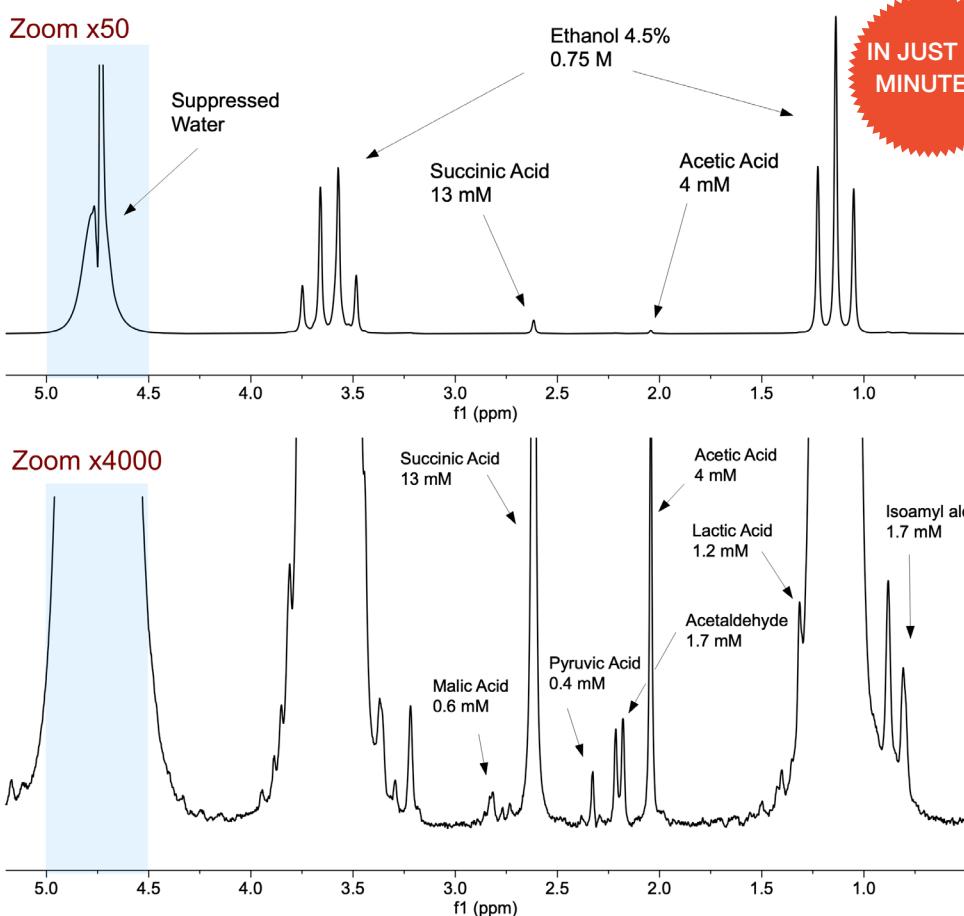
The Spinsolve 60 ULTRA was used to determine the sugar type and content present in soft beverages. The high sensitivity of the system allows you to quantify with high accuracy the concentration of several components like ethanol typically present at very low concentrations in natural fruit juices. These spectra were collected in 8 min., except the Coke Zero was acquired in 1 hour.

	Sucrose	Glucose	Fructose	Total (NMR)	Total (Label)	Ethanol
Grape	0.0	10.0	6.2	16.2	16.0	0.16
Apple	1.1	2.4	6.4	9.8	9.8	0.03
Orange	3.7	2.0	3.8	9.5	9.0	0.02
Coke	6.0	2.8	1.9	10.7	10.7	0
Pepsi	1.1	5.6	4.4	11.2	10.7	0
Zero	0	0	0	0	0	0



*All units g/100ml. Ethanol is % vol.

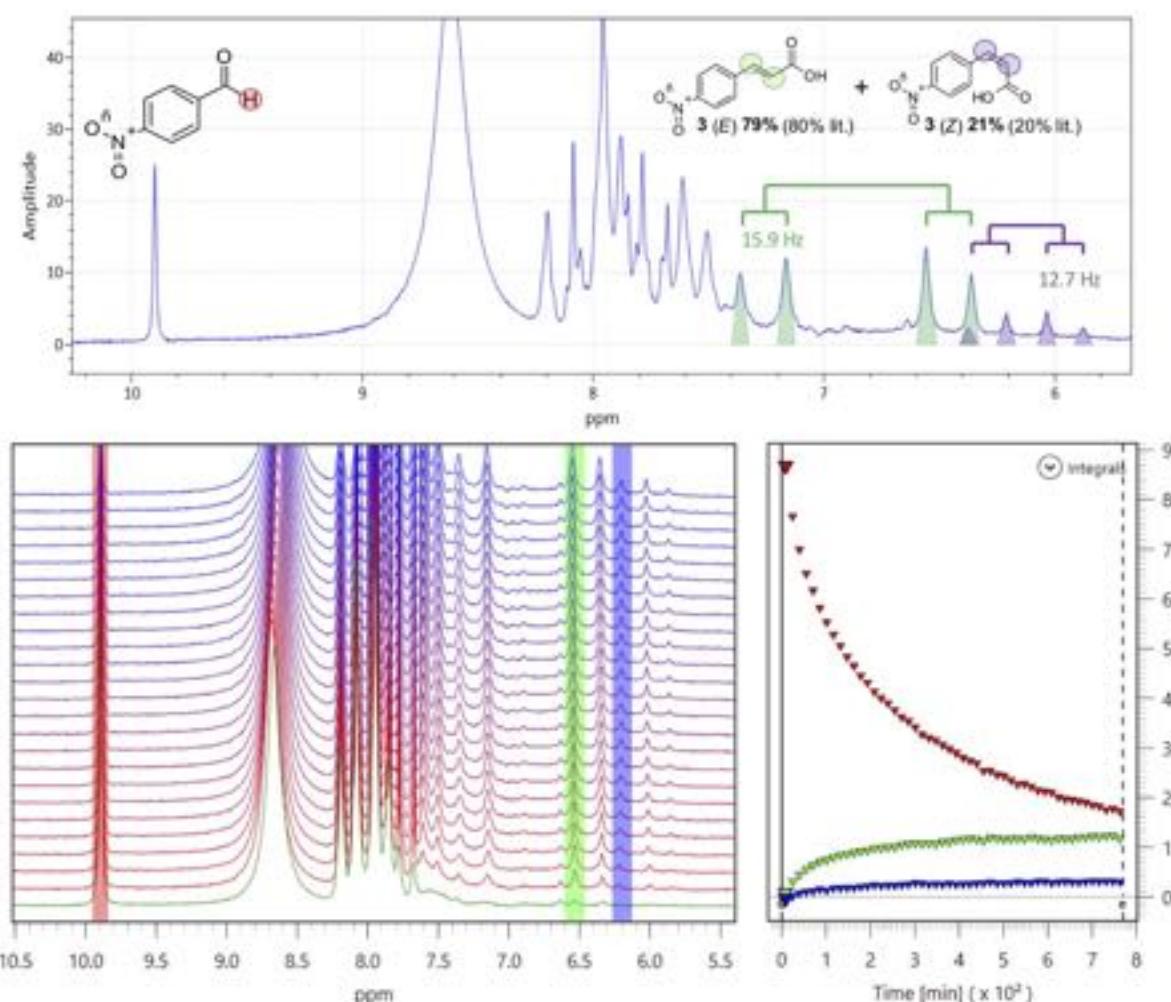
Metabolites produced by *S. Cereviciae* during Glucose Fermentation



The Spinsolve 80 ULTRA is ideal to study biochemical processes like fermentations. The high sensitivity of the 80 MHz model makes it possible to detect metabolites produced at sub millimolar concentrations in just minutes. In this particular example, solvent suppression was combined with carbon decoupling to eliminate the carbon satellites of the NMR signals of ethanol produced during the fermentation process.

Monitoring the formation of diastereomers on-line during a HWE reaction

The Spinsolve 80 ULTRA device was used in combination with our reaction monitoring software package to follow the course of a reaction on-line and also to determine its stereochemical outcome. As an example, the well-known Horner-Wadsworth-Emmons reaction (HWE reaction) was carried out and the result is shown in the figure below. The HWE reaction was essentially developed to form the E-diastereoisomer as the reaction product in favour of the corresponding Z-counterpart.



By employing the Spinsolve ULTRA system, we were able to follow the conversion of the aldehyde as starting material (red signal) and the appearances of the product signals corresponding to the newly formed C-C double bonds (green and violet signals). Moreover, we were also able to determine the E:Z ratio (79:21% in favour of E) by integrating the signals of the corresponding diastereoisomers. The coupling constants were determined to confirm our assignment (16 Hz for the E-product; 13 Hz for the Z-product).

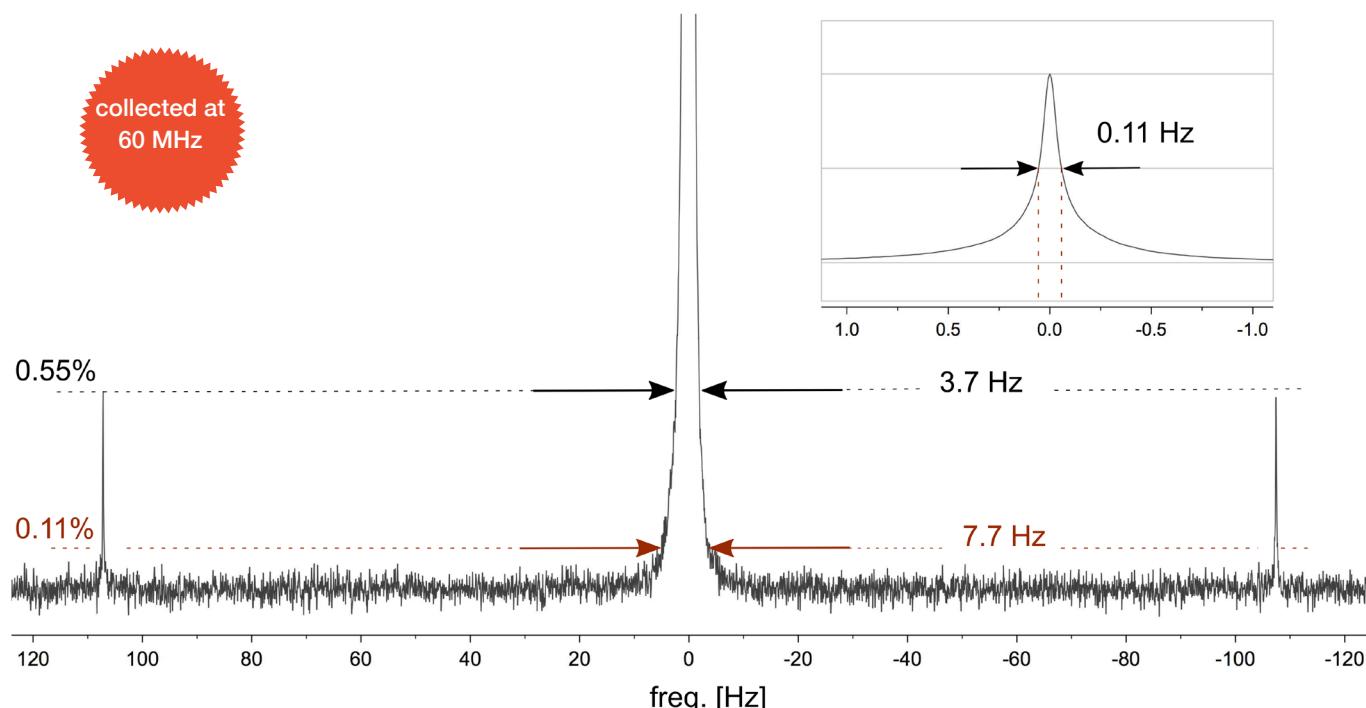
Applications

The high homogeneity of the Spinsolve ULTRA is particularly useful for samples where the compounds to be identified and quantified are dissolved in protonated solvents such as water. Applications include:

- Reaction monitoring in the presence of protonated solvents
- qNMR for samples with important signals overlap
- Detection of impurities and contaminants
- Quantification of sugars and alcohol in beverages
- Identification and quantification of metabolites in biofluids
- Monitoring fermentation processes in bioreactors

Linewidth measured in a chloroform spectrum

- No sample spinning, no spinning side bands, no requirement for compressed air
- No reference deconvolution, only standard NMR data processing is used



Spinsolve ULTRA

- Available at 43 MHz, 60 MHz, and 80 MHz operating frequency (¹H)
- Nuclei: All models measure ¹H and ¹⁹F
Optional X-nuclei: ⁷Li, ¹¹B, ¹³C, ¹⁵N, ²⁹Si, ³¹P (ask for availability of other nuclei)
- Includes a powerful multi-line solvent suppression method
- Includes carbon-decoupled proton acquisition sequences on ¹³C models
- Linewidth specifications for all models measured on 20% chloroform in deuterated acetone:

Linewidth	Spinsolve 43 MHz	Spinsolve 60 MHz	Spinsolve 80 MHz
@ 50%	< 0.2 Hz	< 0.2 Hz	< 0.25 Hz
@ 0.55%	< 6 Hz	< 7 Hz	< 10 Hz
@ 0.11%	< 12 Hz	< 14 Hz	< 20 Hz

The high homogeneity of the Spinsolve ULTRA is possible due to advances in the patented shimming technology used in the Magritek High Homogeneity Halbach Magnets*

*Patent US 8,148,988 and EP 2,144,076

Contact us now for a quote, to request a demo, or to measure your samples

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